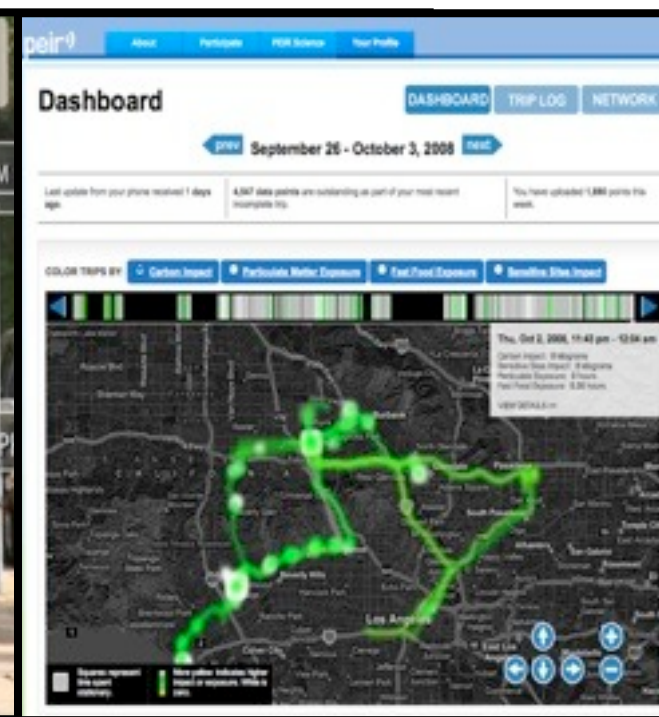


# Participatory sensing, personalization, and privacy

*Participatory Sensing: an approach to data collection and interpretation in which individuals, acting alone or in groups, use their personal mobile devices and web services to systematically explore interesting aspects of their worlds, ranging from health to culture.*

Enabled by  $>3 \times 10^9$  mobile phone users, increasingly with GPS, imagers, rich UI, programmability, and ubiquitous connectivity



# Participatory Sensing: personalizing health and wellness

mobile phones provide real time, real place, real context

what can we learn with access to

...all 168 hours of the week...

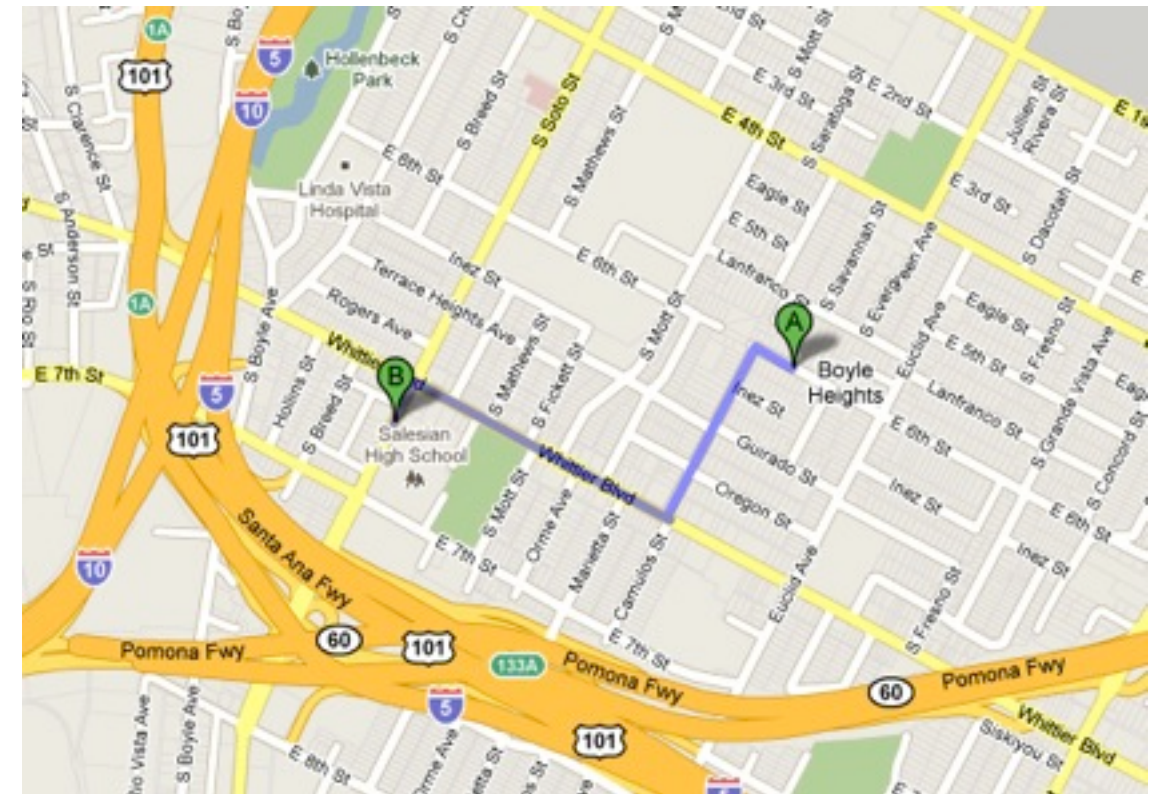
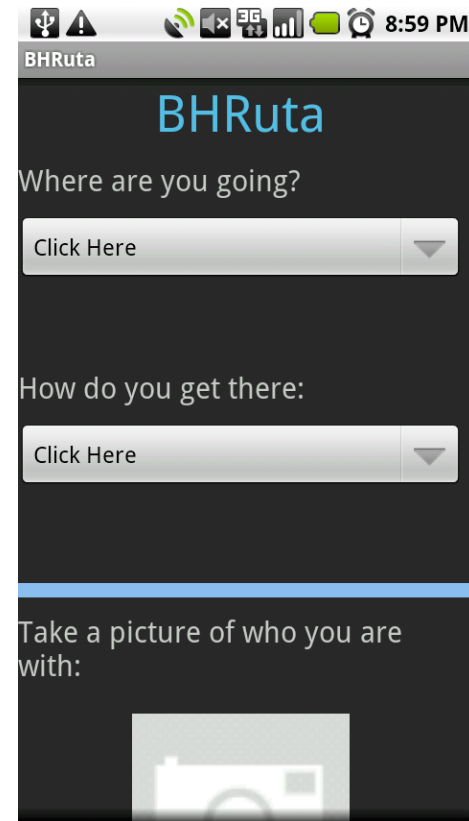
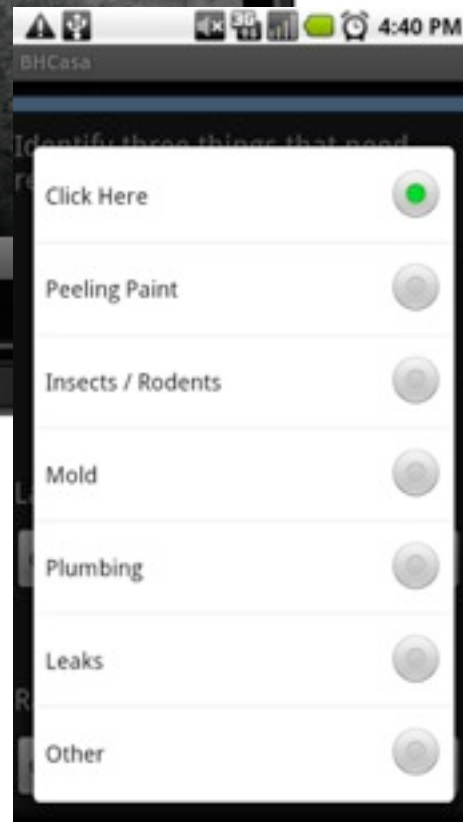
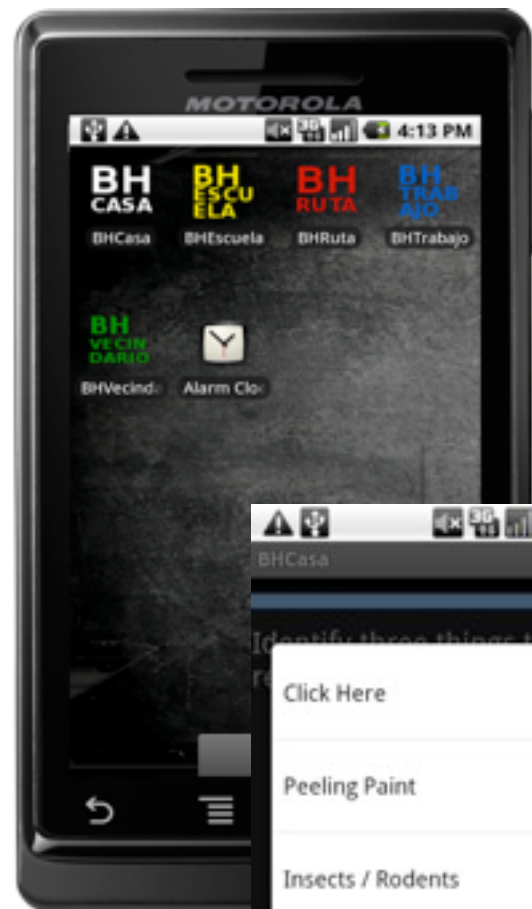
...all 1440 minutes of the day...





# Personal perspectives on community health

*200 Boyle Heights residents documenting conditions in and between work, school, home...where they go and gather, the conditions surrounding them...*



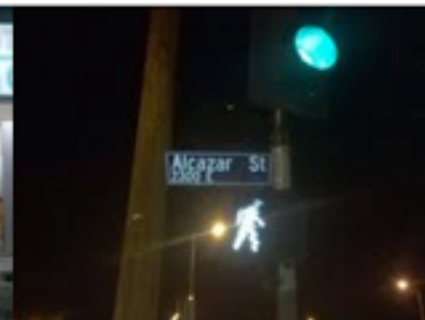
<a href="#">raiders</a>	2010-04-22 22:49:17.310000-07:00	updat: 2010-04-22 22:49:29.580879-07:00	34.06251	-118.19812
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Errands

Place you stopped. What are you doing:  
Other | groceries



What represents your neighborhood:  
street name



How do you get there? Walk  
What where you ate along the way:  
Street vendor



What did you eat along the way:  
Other | tacos



Lukac et al

# Personal data streams: activity traces, experience sampling

## Our Actions



Photo - Marshall Astor

## Our Self Report



## Private Data Storage



Geocoded,  
time-stamped

Mobility  
traces



## Visualization, Feedback, Sharing

Aggregates, features,  
trends, patterns

Processing

## Event detection



# *Telling traces!*

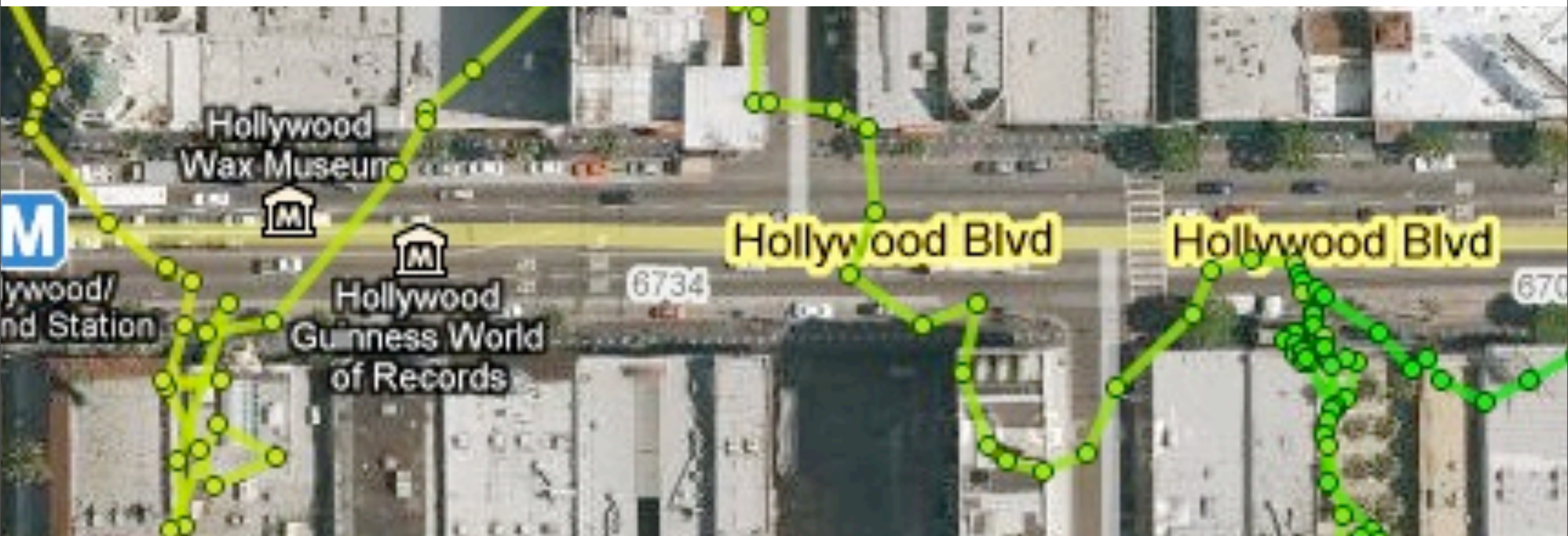
Activity-location traces quantify habits, routines, associations

Easy to share and mine; but difficult to anonymize

Data handling by mobile carriers, credit card companies, is regulated

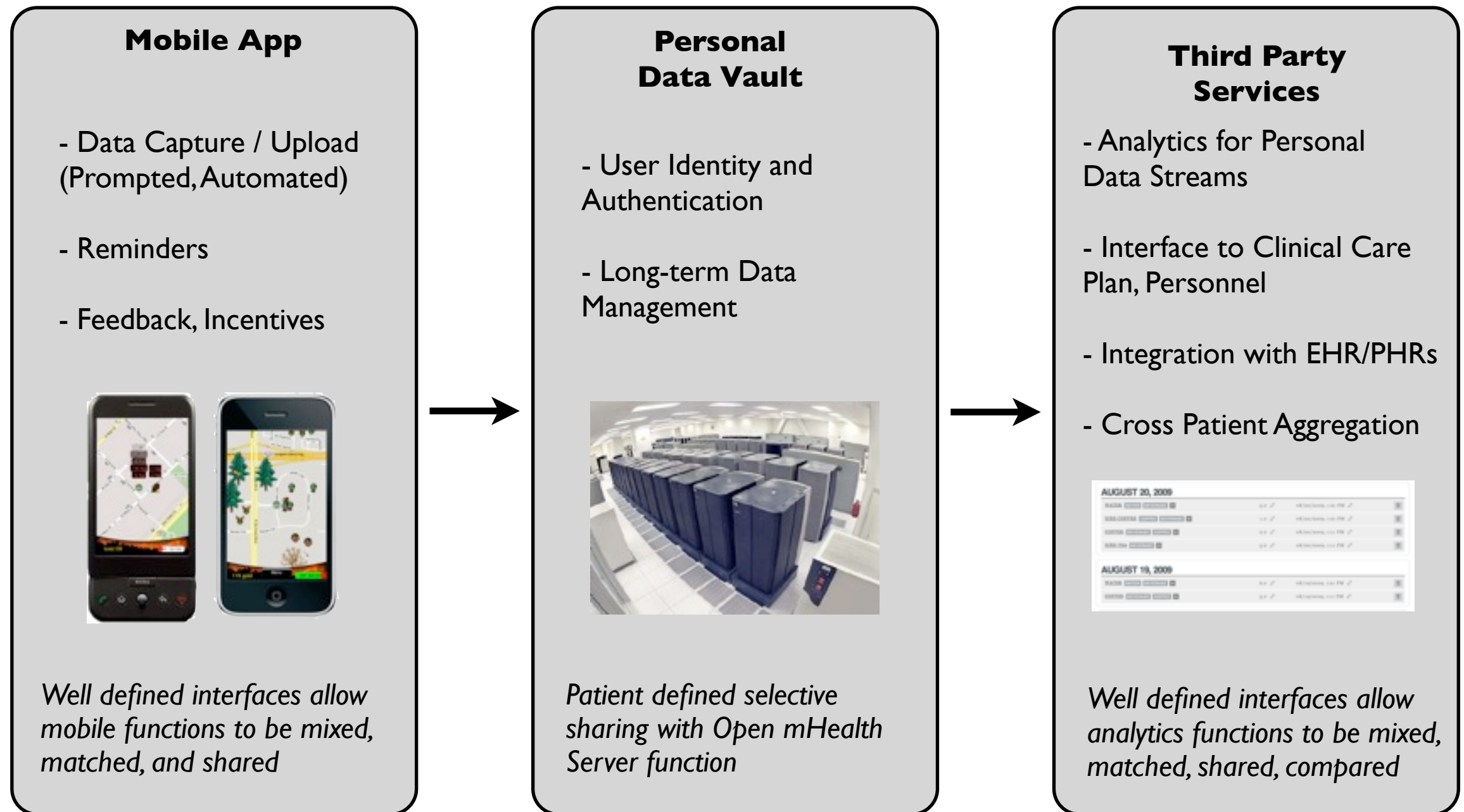
With Participatory Sensing, individual is free to capture and share her own data... for free apps and services... *“Everything is free to you, except for the data we collect about you”*

Calls for new privacy practices...



# Personal Data Vault (PDV):

allow participants to retain control over their raw data



**vault + filters = granular, assisted control** over what you send to who, what that data says about you, whether you reveal who you are or share anonymously, ...



# Participatory Sensing is a driver of social, Internet, and privacy innovation

So much **we**  
can learn and share...



So much *they*  
can learn and share...